

**Amendments to the Claims:**

Please cancel claims 2, 13, 15, 18 and 26 without prejudice.

Please amend claims 1, 10, 16 and 19 as follows.

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) A method for identifying ~~a bioactivity or a biomolecule~~ an enzyme of interest, comprising:
  - (a) obtaining a plurality of polynucleotides derived from a mixed population of organisms or more than one organism;
  - (b) normalizing the plurality of polynucleotides to allow equal representation of all polynucleotides in the mixed population of organisms;
  - (c) contacting a library containing clones of normalized polynucleotides from (b) with at least one oligonucleotide probe labeled with a detectable molecule, wherein the probe comprises at least a portion of a polynucleotide sequence encoding an enzyme of interest;
  - (d) incubating the clones under such conditions and for such time as to allow hybridization of complementary sequences; and
  - (~~[[d]]~~)e) separating clones with an analyzer that detects the detectable molecule;
  - (f) contacting the separated clones with a reporter system that comprises a substrate for the enzyme of interest; and
  - (g) identifying clones capable of modulating expression or activity of the reporter system thereby identifying a polynucleotide that encodes the enzyme of interest.

Claim 2. (Cancelled)

3. (Previously presented) The method of claim 1, wherein the library is an expression library.

4. (Previously presented) The method of claim 1, wherein the detectable molecule is a fluorescent molecule.
5. (Previously presented) The method of claim 1, wherein the analyzer is a FACS analyzer.
6. (Previously presented) The method of claim 1, wherein the mixed population of organisms is from an environmental sample.
7. (Previously presented) The method of claim 1, wherein the mixed population of organisms comprises microorganisms.
8. (Previously presented) The method of claim 6, wherein the environmental sample contains extremophiles.
9. (Previously presented) The method of claim 8, wherein the extremophiles are selected from the group consisting of hyperthermophiles, psychrophiles, halophiles, psychrotrophs, alkalophiles, and acidophiles.
10. (Currently Amended) The method of claim [[2]] 1, wherein the reporter system is a bioactive substrate.
11. (Previously presented) The method of claim 10, wherein the bioactive substrate comprises C12FDG.
12. (Previously presented) The method of claim 11, wherein the bioactive substrate further comprises a lipophilic tail.

Claims 13-15 (Cancelled)

16. (Currently amended) The method of claim [[15]]1, wherein the clones are encapsulated in a microenvironment [[is]] selected from beads, high temperature agaroses, gel microdroplets, cells, ghost cells, macrophages, or liposomes.

17. (Previously presented) The method of claim 16, wherein the clones are encapsulated in a gel microdroplet.

Claim 18 (Cancelled)

19. (Currently Amended) The method of claim [[18]]1, wherein the enzyme is selected from the group consisting of lipases, esterases, proteases, glycosidases, glycosyl transferases, phosphatases, kinases, mono- and dioxygenases, haloperoxidases, lignin peroxidases, diarylpropane peroxidases, epoxide hydrolases, nitrile hydratases, nitrilases, transaminases, amidases, and acylases.

20. (Previously presented) The method of claim 1, wherein the reporter system comprises a detectable label.

Claim 21 (Cancelled)

22. (Previously presented) The method of claim 1, wherein the polynucleotide of interest encodes a small molecule.

23. (Previously presented) The method of claim 1, wherein the polynucleotide of interest, or fragments thereof, comprise one or more operons, or portions thereof.

24. (Previously presented) The method of claim 23, wherein the operons, or portions thereof, encodes a complete or partial metabolic pathway.

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25. (Previously presented) The method of claim 24, wherein the operons or portions thereof encoding a complete or partial metabolic pathway encodes polyketide syntheses.

Claims 26-61 (Cancelled)